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Video Science: Cinema as Sense Organ

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Abstract

The moving image exists at the interstice of art and science not only because it acts as a representation of human sight but also because it exemplifies the observational processes related to the scientific gaze. As such, film and video have extended human sense-perception properties by mimicking and manipulating the natural processes of the optic nerve. The capture – and in many cases, the simulation – of movement generated from the progression of images reveals a new sphere of human consciousness as it relates to the dimensions of motion, space, and time.

The conceptualization of the time-element present in film and video has been a prominent feature of film and new media theory since the invention of cinema. Cinematic processes are not only analogues of sight but also companions to the brain's cognitive function. The camera, therefore, is more than a metaphor. It is an extension of the optic nerve, and as such, it provides new methods of understanding time as it relates to motion and space. Cinema, moreover, has become an integral component of the human consciousness. Because film and video have expanded the understanding of cognitive processes, filmmakers and video artists are charged with the task of utilizing the manipulation techniques inherent to the media in order to enhance the connections between eye and camera and between brain and screen.

The goal of my work is to enable my audience to observe the infinitesimal changes that take place as moments in time are created. Video is a device that I employ to make greater parallels between the absolute and the ordinary. By blurring the lines between artistic practice and scientific process, I strive to create a visual methodology which concerns itself with the construction and documentation of microcosmic environments and events resulting from chemical processes.

Table of Contents

Introduction

The perception and illusion of time via the capture of motion is the fundamental characteristic of film and video art that transcends mechanical filmic processes in order to construct the conceptual foundation on which such media is based. The innate property of moving images to visually express, measure, and observe time helps one not only to examine but also to transcend human understanding of vision and cognition. Descriptions of the relationship of film and video to human sense perception can be found in numerous theories surrounding film, media, and communication philosophies. By surveying these theories one can follow the evolution of visual time-based media from being described as a simple metaphorical eye mechanism to being thought of as the manifestation and extension of the human consciousness.

The understanding that film and video are manifestations of consciousness has re-contextualized the understanding of sight.[1] It can be said that because cinema offers new ways of visualizing motion and space, not only are the camera and the monitor analogous to the optic nerve but also that these machines have become combined sense organs with our eyes in such a way that it has produced a symbiotic relationship between the human vision and external machine.[2] Sight – and to an extension, the image itself – is a tool for accessing knowledge about our world. Because cinema concerns itself with visual motion and space, moving images offer a new tool to gain information about the way in which we are physically able to view the world around us.

My work utilizes the principles of movement-time and spacetime by exploring the manipulation factors of digital film. The genesis of my practice was rooted in my interest in the

time-element of video art. I have remained obsessed with the simulation of movement produced by series of images, the artifice of constructed objects in motion, and the defects in time and space that those simulations and constructions created, and my digital films are process-oriented events that focus on time control and editing.

The Cinemagraphic Image

My work *Viscera* (2012) is a short animated sequence with a runtime of seven seconds. It is composed of fifty-six sequential photographs of a slug-like organism crawling into frame and then quickly across and off screen (Figure 1). The creature is made from the seeded entrails of a honeydew melon stuffed inside a condom, and movement within the video is a simulation of motion created during the animation process by manually shifting and nudging the form.

Although this and other earlier works deviate from my current concentration on microcosmic landscapes and events created from chemical processes, they serve as examples of my practice's overall focus on time and the manipulation thereof. Moreover, they established a way of working with video that is based on simple editing techniques and the preoccupation with dissecting video millisecond-by-millisecond, frame-by-frame. The editing and creation of my animated works were focused on the compilation and sequencing of individual images rather than using filters and effects.

This stop-motion animation process eventually led me to create entirely digital pieces. Composed of 349 individual images with a runtime of approximately fifty-seven seconds, *Skulk & Scuttle* (2012) is the first portion of an animated short that relied heavily on a Photoshop technique that allows me to mimic cut-out animation (Figure 2). Similar to *Viscera*, the animation features a slug-like creature crawling across and on the sides of the image frame. When reaching the top of the screen, the creature attaches, cocoons, and hatches into a multitude of flying insects.

Traditionally, cut-out animation is a stop-motion technique in which films and video are created by manipulating pieces of two-dimensional materials such as paper and fabric. Like stop-motion, the illusion of movement in cut-out animation is created by taking photographs of constructed scenes after minute changes are made. The process for creating *Skulk & Scuttle*, however, was completely digital.

The entire animation was constructed in a single Photoshop document by utilizing the layer and transform properties of the software to move and manipulate individual elements of the composition. Each incremental change made to the master file was saved as a separate jpeg. These jpegs were later compiled and placed in sequence. I focused on the rates of duration and speed in which frames are displayed rather than using extravagant video editing techniques.

These early works, moreover, were responses to traditional two-dimensional animation and reactions against the saturation and over celebration of three-dimensional, sculptural graphics. In both *Viscera* and *Skulk and Scuttle*, I used technology in such a way that it mimicked and enhanced traditional processes but did not try to overcome them to produce a simulacrum of reality. By putting together a series of images, I was able to distill, extrapolate, and present motion.

From the very beginnings of film criticism, theorists sought to compare the optic nerve to the camera. Many of these theories correlated the storage and retrieval of memories to the segmented process of creating and editing film. In 1907, philosopher Henri Bergson wrote of the world being an accumulation of images. He stated, "We take snapshots, as it were, of the passing of reality… Whether we would think about becoming, or express it, or even perceive it, we hardly do anything else than set up a kind of cinematograph inside us. We may therefore sum up

what we have been saying in the conclusion that the mechanism of our ordinary knowledge is of a cinematographic kind."[3]

The philosopher Gilles Deleuze expounded Bergson's view of the cinemagraphic image in *Cinema 1: The Movement Image* (1986). From theories put forth in Bergson's *Matter and Memory*, Deleuze formulated three theses on motion that can be used to analyze and contest the nature of film and video as they relate to space and time. The first thesis states, ""Movement is distinct from the space covered. Space covered is past, movement is present, the act of covering. The space covered is divisible, indeed infinitely divisible, whilst movement is indivisible, or cannot be divided without changing qualitatively each time it is divided."[4]

As such, movement is thought to only occur at the interstices of space. It is this postulate on which the other two premises concerning movement are based. They follow that movement is made of separate, isolated instances and that movement is comprised of changes in duration within a solitary, insolated system.[5] The three Bergson-Deleuzian theses on movement express a mechanized view of motion, space, and time by which one can evaluate and scrutinize the moving image, and the formative properties that allow the creation of motion pictures follow the criteria provided by these explanations of movement-time in that moving images offer ways to not only observe, measure, and express time but also to mimic and manipulate it.

In *New Philosophy for New Media* (2006), film theorist Mark Hansen explains that cinema is not merely a "technical image medium" but is "the privileged mode through which images, as the material bases of contemporary perception, are actually lived and experienced."[6] I believe that by using video, I am able to present to the world an awareness of time that exists outside the normal human sense range. This observation of time is disconnected from our own experience of living. It is a sense of time that is encapsulated in the machine. According to

communication theorist Marshall McLuhan in *Understanding Media: The Extensions of Man* (1964), this mechanized view of time was augmented with the advent of the camera. He explains:

> "Just as a great revolution in mathematics came when positional, tandem numbers were discovered... great cultural changes occurred in the West when it was found possible to fix time as something that happens between two points. From this application of visual, abstract, and uniform units came our Western feeling for time as duration. From our division of time into uniform, visualizable units comes our sense of duration and our impatience when we cannot endure the delay between events."[7]

This connection between the mechanization of time and the invention of the camera can be better understood by dissecting the technical process that allows for the creation of moving images. In the late 19th century, photographer Eadweard Muybridge sequenced together twelve photographic frames of a horse in motion, creating what some considered to be the first animated film and laying the groundwork for what would come to be known as the motion picture. The original photographic and subsequent animated study of horse locomotion were produced as an investigation set to prove that a horse at some moment in full gallop would have all four legs off the ground at once – a hypothesis of motion that the human eye cannot directly perceive (Figure 3).[8]

Commissioned by industrialist Leland Standford, Muybridge performed the experiment at Standford's Palo Alto farm on19th June 1878.[9] The test was conducted by arranging a series of twenty-four stereoscopic cameras twenty-one inches apart along a horse track, taking into account the twenty feet breadth covered by the horse in stride.[10] Each camera was controlled by a trip wire and when triggered would snap pictures at one thousandth of a second.[11]

By reviewing the still frames of Muybridge's first animated sequence, one can surmise that the distillation of time appears as twelve single moments. "The sequential ordering of the images is the basis of our assumption of scientific reliability," and through each frozen instance, the viewer is able to explore time manipulated in such a way that when placed in succession, the series of images bridges the gap between still and moving images.[12]

Although film and video are not mechanically captured or displayed in the same manner, both are conceived by rapidly presenting a progression of images at such a rate that vision is allowed to persist. The relationship between one image and its neighbor is broken down into terms of speed or duration. The speed at which the succession of images is viewed or the duration in which each image lasts on the screen establishes the relationship between neighboring images of the film or video. When projected at a fast enough speed, the eye views the sequence of images as one event. By combining in a single moving composition multiple pictorial images, each image becomes part of a montage, that is, each image become overlaid or interlaced with its neighboring images.[13]

Within my work, the simulation of movement produced by a series of images and the artifice of constructed objects in motion highlight the defects in time and space that these simulations and constructions create. The contingency of animation lies in the interstice or the between-two-images that occurs not only in our own brains when perceiving the image, but in the machine software during compositing. The capture of movement is the simulation of motion and the artifice of time. In *Expanded Cinema* (1970), Gene Youngblood explains:

> "The classical tension of montage is dissolved through overlapping superimposition. For example: we have shots A, B, and C. First we see A, then B is superimposed over it to produce AB. Then A fades as C fades in. There's a brief transitional period in which we're seeing ABC simultaneously, and finally

> we're only looking at BC. But no sooner has this evolved than B begins to fade as D appears and so on." [14]

These images are interlaced to create a liminal image from the superimposition of a frame and its neighbors. Because the interstitial image (AB, ABC, BC, BCD, etc.) does not exist in reality, because they are virtual phenomenon created by brain to resolve matters of sight, they are evidence that the viewing of moving images is an expansion of the human senses.

In *Cinema 1: The Movement Image*, Deleuze eventually goes on to reject the notion that cinema is a collection of still frames. He argues that Bergson's theory overlooked the cumulative, moving image produced from the cinematographic process.[15] I agree that by focusing only on the mechanical aspects of the medium, Bergson could only surmise that cinema imitated the eye. One can concluded that cinematographic processes actually reveals the mechanisms of perception by focusing, on the moving image produced from the accumulation of frames.

"The sequence cues us to believe that the action represented is continuous and ongoing, and that it takes place exactly in the order in which we see it reproduced," and our perception is so bound to our belief in the serial structure of motion, space, and time that our brains "fill in parts that are missing, the inexplicable gaps between the separate phases of the movement. The sequence directs us to cooperate in creating the illusion of motion even where there is none."[16] This describes the phi phenomenon and the persistence of vision – the primary psychological mechanisms of perception that can be analyzed via moving images. The former simply refers to the illusion of continuous motion produced from viewing objects in rapid succession,[17] while the later refers to the way in which an afterimages seemingly persists on the eye after one views an

image and the initial exposure to that image has ended.[18] Both of these mechanisms can be readily studied in my work by dissecting the cinemagraphic process of animation.

There is a glitch in motion inherent to both *Viscera* and *Skulk & Scuttle* that was created in the rendering process and produced from a discrepancy in frame rate/amount of frames used. Both videos have a frame rate of 30 frames per second. *Viscera* is compiled from 56 frames, each with a duration of 120 milliseconds. This equals a runtime of 7.68 seconds. Normally a video that lasts for 7.68 seconds shown at a rate of 30 frames per second would be composed of approximately 230 frames.

Because the animation was produced with significantly fewer frames than what is normally required, there is a hitch in the motion – a jaggedness to the movement of the honey-dew melon slug that would otherwise be perceived as smooth given enough frames. Although vision still persists and one can make sense of the scene, the lack of frames, the duration for which the frames last, and the rate at render means that the human brain has to do more work concerning the phi phenomenon. The same principle is at play for *Skulk & Scuttle* which is composed of 348 frames, each frame having a duration of 160 milliseconds.

In my opinion, the cinematic aesthetic thus seeks to tap the potential of its digital format in such a way that "recognizes and accepts the autonomy of the technical in the form of digital information."[19] Instead of viewing this trajectory as "a threat to human experience, as a material shift that make human perception henceforth irrelevant, it seeks to pinpoint and explore the potential of information to empower the human, to enlarge the scope of the human grasp over the material world."[20]

Time Beyond Movement

In my digital film *Alternative Phase Sequence* (2013), a white cube slowly transforms into a rolling, cloud form (Figure 4). It is the manifestation of uncontrolled energy, an expulsion resulting from event-as-matter and presented as a transformation with an unknown cause. There is something passive-aggressive about the structure's movement. It is a quiet type of violence that is reminiscent of a coming storm. The creation of this formation was produced from a simple biochemical reaction resulting from the introduction of microwave heat to an aerated cleaning surfactant. The transformative properties produced within the work is indicative of natural structures – billowing clouds, a roving storm, smog condensation – and of man-made destructive events – demolitions, nuclear tests, explosions.

With a runtime of two minutes, *Alternative Phase Sequence* contains no sound and is organized as multiple video panes, each displaying the same scene in different time arrangements (Figure 5). The organization of the panels construct competing narratives by providing a way to analyze multiple sets of visual information according to variables in and of time. The temporal organization of the video is managed not only in terms of speed but also in terms of reversal. The original footage lasts fifty-seven seconds, and is duplicated as three separate videos within the frame. Moreover, the video features a timestamp as a dependent variable, the constant by which the three video panels are assessed. Although the organization of the separate video sections occurs in different time arrangements, the timestamp is sequenced with the two minute runtime of the final video.

The action of the video panels is arranged as follows: The first movement of the left video pane unfolds at a rate of 190% real time lasting for a duration of thirty seconds, while the action of the middle and right panes are presented at rates of 95% and 47%, respectively. Action in the right panel occurs as a single section with the 47% increase in time remaining constant throughout. The action of the middle and left videos both occur in two sections. When the second section of the middle pane occurs at the one minute mark, the video is reversed at a rate of 71% causing the action overturn. The second section of the left panel reverses at the thirty minute mark at a rate of 55%, the action slowly withdrawing for ninety seconds. By alternating the time element between multiple panels within a single frame, I created an optical canon – a visual round of imitation and duration – and together the three panes can be seen as the prologue, interlude, and epilogue of action.

Following attitudes maintained by the ancient Greeks, early film theory and the early films of the twentieth century hypothesized and exemplified the nature of motion in terms of the dimensions of space and time. "From antiquity through the seventeenth-century, time had been subordinate to movement: time, as Aristotle said, was the measure or 'number' of movement."[21] Ancient philosophers sought a permanent variable separate from motion that would act as standard index by which all motion could be gauged. This notion implies that time is merely the multiplicity of movement.[22]

This idea, however, is outdated. I believe that the trajectory of time-based media actually follows a more syncretistic view of time as it relates to cinema. McLuhan states, "Now in the electric age of decentralized power and information we begin to chafe under the uniformity of clock-time. In this age of space-time we seek multiplicity, rather than repeatability of rhythms."[23]

This repeatability of rhythms, this idea that cinema is now trying to mimic our natural sense-perception of temporality in order to demonstrate a higher consciousness, is a correlative of the earlier idea that cinema imitates cognitive functions related to the perception of motion. It is a shift that promotes a sense organ that transcends notions of subject and object by combining them.

Youngblood termed this trajectory "synaesthetic cinema," and he defined it as "an art of relations of the conceptual information and design information within the film itself graphically, and the relation between the film and the viewer at that point where human perception (sensation and conceptualization) brings them together."[24] As such this new shift in cinema represents the chronotope, the space-time continuum.[25].

The creation of a moment in time that is not there "takes place in the body-brain of each specific viewer-participant" and is the physical manifestation of which can be seen as an observation of time not observed, or the creation of time itself, thus encapsulating cinematic time to a space of mechanics.[26] The manifestation of time as image, as a measurable unit that can be manipulated, is inextricable from conceptualizations of the media. "As these analyses suggest, machinic process have fundamentally altered the infrastructure of our contemporary lifework in ways that directly impact our temporal experience."[27] Regarding this theory, Deleuze states:

> "Time ceases to be derived from the movement, it appears in itself and itself gives rise to false movements. Hence the importance of false continuity in modern cinema: the images are no longer linked by rational cuts and continuity, but are relinked by means of false continuity and irrational cuts. Even the body is no longer exactly what moves: subject of movement or the instrument of action, it becomes rather the developer of time..."[28]

Moreover, film and video present "the haunting possibility of capturing over time phenomena that had escaped static means of representation such as histology, photography, or

drawing." [29] Paying attention to the distinction and relevance of film as a time-based medium is the key to understanding how the progressive time-based nature of film and cinema have allowed new forms of detailing, evaluating, and authenticating information. "A whole new world of temporal phenomena, previously below the threshold of perception, was opened up by the manipulation of the time of observation compared to the time of the experiment."[30] Time is essential to the nature of my studio practice, especially concerning the acceleration and deceleration of movement. It is the variable of the experiment over which I have the least amount of control. It is the variable that provides contingency.

My five minute forty-five second digital film *Open Function* (2013) is a silent, two-channel video installation depicting four red masses slowly that transform themselves… swelling and bursting in a dehiscent attempt at expulsion of self (Figure 6). The forms mushroom out like fungi or atomic bombs, and then at the opportune moment – the moment of full openness – the action reverses itself, their contents packing themselves back into contained red bodies (Figure 7). Shown on a loop and viewed over an extended amount of time, the masses obtain a steady rhythm… breathing.

The experiment was conducted by placing an ibuprofen tablet on a single drop of water. The resulting video presents the hypotonic process that followed. The ibuprofen's release of materials is a maladaptive chemical response to osmosis resulting from the impulsion of water after it dissolves the polymer coating of the pill and reaches the compressed, powdered form of the active, pharmaceutical ingredient. The reaction is paradoxical to the anti-inflammatory nature of the drug, and one can view the act as a protective attempt that equates in a destructive event.

It has become important for me to distinguish between material and subject matter within my work. The materials that I use are not the subject of the work, and any correlations that are

made by me revealing their use is superfluous and contrary to my aim at creating greater conceptual metaphors related to microcosmic events and landscapes. I noticed that after disclosing that the object featured in *Open Function* was an ibuprofen tablet, the focus of the conversation shifted from how the pill behaved to making correlations of the pills effect on the body.

This is not the aim of my work, and I am not interested in explicitly presenting or promoting dialogue related to the social connotations that may be inherent to pills, soap, or whatever material I decide to use (e.g. pills being associated with the effects of medicine on the body or soap being associated with ideas of cleanliness and domestication). I do not wish to essentialize or reify the objects featured in my work because they simply are not the subject. I try to avoid such correlations by focusing specifically on action and motion.

It is not so much important what the object *is* as it is important what the object *does*. This is not to say that content is not important, but it does dictate that content is dependent on factors surrounding time. Because of this, manipulations in film and video are often manipulations in time. McLuhan states, "Once time is mechanically or visually enclosed, divided, and filled, it is possible to use it more and more efficiently."[31] The manifestation and simulation of energy and mass presented in my work are more than explosions and ruptures. They are expulsive transformations contained in clinical space. They are events in matter – stochastic, emerging forms rooted in the realm of ambiguity and temporality.

I am interested in the conceit of abstraction, the manipulation of the chronotope to promote notions of repetition within the universe. I suppose I am entering the domain of the pataphor, in that the source domain for the analogies I am attempting to create are ignored or

hidden. The subject matter of my work is the event-formation, the being and becoming of the form. This philosophy is guided by the ideas of movement-time and spacetime.

The idea of a single spatial and temporal dimension is mirrored in philosopher and critic Mikhail Bakhtin's literary theory of the chronotope. In *The Dialogic Imagination* (1975), Bakhtin describes as the spatial and temporal fusing of both physical and intangible aspects. Bakhtin writes: "Time, as it were, thickens, takes on flesh, becomes artistically visible; likewise, space becomes charged and responsive to the movements of time, plot and history. This intersection of axes and fusion of indicators characterizes the artistic chronotope."[32]

Bakhtin's theory of the chronotope was influenced by the concept of spacetime introduced by Albert Einstein in 1905 in his seminal work "On the Electrodynamics of Moving Bodies."[33] In the essay, Einstein proposes his special theory of relativity concerning the relationship between time and space. The theory introduces the idea of spacetime, which maintains that space and time should be considered as a single dimension.

Together the theories of spacetime and the chronotope have shaped modern understanding of time not only theoretically and artistically, but also as it concerns everyday life. As described, time is considered to serve two modalities, one that is quantitative and is measured as days, hours, minutes, seconds, etc., and one that is qualitative and is comprehended as pure sensation. It only follows that the nature of film and video in the twenty-first century almost entirely functions and serves the course of un-abstracted representation. As such, the medium exists as a summary of realities that preserve the materiality of experience.

Purveyors of Vision

The PWR (2013) is a five minute and forty-five second silent digital film that scans a red, molten landscape. The scene is reminiscent of both magma and placenta, and motion within the video is contained to a fluid bubbling and trickling under the surface of a still image as the camera slowly pans from right to left (Figure 8). By moving the camera-eye over a single abstract event, I hoped to challenge my audience's sense of perception by presenting them with notions of past, present, and future on a single spatial plane – one in which chronological and spatial organizations exist without cause and effect.

The PWR began as a single image file. The original photographs and video used to make this work were taken of a fountain dyed crimson in celebration of the 2013 World Series. The image used in the video is a panorama created from several photos that were color corrected and vertically flipped. By flipping the photos, I changed the perspective of the view in such a way that it completely reversed the spatial arrangement of the scene, making it almost unrecognizable from its original source. Instead of water shooting upwards from a fountain, the photo became reminiscent of a waterfall. By compositing several of these photographs together, I further distorted the imagery by creating a single, panoramic landscape.

I created *The PWR* by superimposing this oversized image onto video footage of the same bubbling fountain depicted in the photographs. I initially rendered the clip at two minutes and thirty seconds, but later increased the duration to five minutes and forty-five seconds. This extension of time forces the audience to witness very minute details contained within the scene. Futhermore, the use of slow-motion within the video allows my viewers to experience something

beyond the camera's voyeuristic eye. *The PWR* is a compression of time resulting from a magnitude of imperceptible consequences. Moreover, time within the video behaves as not only a continuous, measurable quantity, but also as a multiverse of the space-time continuum.

Since the 1970's, experimental filmmakers and video artists like Hollis Frampton, Paul Sharits, Stan Brakhage, Bill Viola, and Stan Vanderbeek have "examined filmic structures in order to explore the paradoxical idea of non-narrative movement in time by employing non-developmental structures."[34] These structures included things such as the insertion of frame cuts, the projection of flicker effects, the removal of the shutter, the use of looped time, and variable frame rates sourced in the capture and projection of motion.[35]

Stan Brakhage is known for a film philosophy that investigated visual perception. In the fifty one years in between 1952 and 2003, Brakhage produced over three-hundred-and-fifty films of varying lengths, creating work that explored a plethora of themes and subjects that ranged from childbirth to war to death.[36] The most noteworthy thing about his work, however, is that his films do not simply express metaphors concerning this theme, but rather they are the manifestations of sight itself.[37]

Like myself, Brakhage's primary goal as a filmmaker was to make his audience *see*, and he attempted to do by structuring his works in such a way that they reconfigured the sense of sight and gave form to vision.[38] In the introduction to *Metaphors on Vision (1963)*, Brakhage describes his philosophy as follows:

> Imagine an eye unruled by man-made laws of perspective, an eye unprejudiced by compositional logic, and eye which does not respond to the name of everything but which must know each object encountered in life through an adventure of perception. How many colors are there in a field of grass to the crawling baby unaware of 'Green'? How many rainbows can light create for the untutored eye? How aware of variations

> in heat waves can that eye be? Imagine a world alive with incomprehensible objects and shimmering with an endless variety of movement and innumerable gradations of color. Imagine a world before the 'beginning was the word.'[39]

Brakhage expressed this philosophy in his work by abandoning the formulaic narrative methods often used in popular media. Instead he used a used a variety of experimental techniques that not only include multiple shifts in perspective, variations in focus, and changes in exposure, but also involve the physical manipulation of the film media by painting on and collaging pieces within the film strip.[40] Moreover, the majority of Brakhage's films are silent. This decision was based on the belief that sound governs and directs vision. Brakhage's philosophy asserted that only in silence is it "possible to realize the subtle and complex visual rhytms that his aesthetics depended upon."[41]

By creating films in such a manner, Brakhage shifted his audience's focus away "from objects and possessiveness and toward a state of nonacquisitive, almost immaterial flow."[42] In doing so, he provided an alternative to the objectification of subject that governs visual culture. Brakhage is often described as a "documentarian of subjectivity," and as such, his films expose his audience to their own subjectivity by introducing them to the multiplicities of visual perception.[43]

Writing about a new language for cinema, he proposed that film is a way in which people could externalize human cognition, and he argued that the merit of film rested in its ability to demonstrate "'moving visual thinking'" – the "'non-verbal, non-symbolic, non-numerical.'"[44] Brakhage's work stood as a response against the invariable and stable security of television and Hollywood. "Objective measurement, predetermined forms, the overall arc structure of most

narratives—all were to be undermined because they block the individual from experiencing the unpredictability of the inner life."[45]

Perhaps Brakhage's best known work is his 1963 film *Mothlight* (Figure 9). The most notable aspect of the four minute film is that it was created without the use of a camera. Brakhage constructed the film by pressing moth wings and flower petals between two strips 16mm splicing tape, commissioning a photography lab to contact print the tape so that it could be projected in the theatre (Figure 10).[46] The translucent materials used in the assemblage allowed the transmission of light to cast the silhouettes of the trapped fragments onto the screen.[47] The resulting assemblage of the film takes the viewer through the complexities of human sight: The progression of motion is a flash of dingy pastels, and the rhythm of the film flickers and bursts, leaving faint impressions of shape and form as a succession of afterimages burned onto the eyes of the audience (Figure 11).

The creation of time goes beyond the mechanisms of the eyes and brains and manifests itself in both technique and content. The most successful time-based media is aware of these philosophical qualities and manipulate them. McLuhan states, "Our new electric technology is organic and non-mechanical in tendency because it extends not our eyes, but our central nervous systems..."[48]

I believe that as the world rapidly approaches the hyper-real, one has to go beyond generative. All art is artifice, and the goal of artifice is to mimic the sublime in carbon copy tribute to reality. Sometimes truth reveals itself in the perfection of the conceit, sometimes in the flaw. My work exposes this artifice through the manipulation of the space-time element. The techniques of overlay, superimposition, and distortion used in my video work create in-between

forms of perception that continue to expand the human sense organ beyond that of the optic nerve.

My thesis project *Charybdis* (2014) is a four minute, two-channel, unsynchronized video installation. The left monitor features a viscous, black landscape, the action of which jump-cuts from placid bubbling to frenetic boiling (Figure 12). The staccato pacing of this video is juxtaposed to the exponential fluidity of the emergence and reversals of the coral-esque bloom featured in the right video (Figure 13). This project is an examination of the transformative process by which complex systems arise out of the multiplicity of simple instructions, and the way that time is organized in the film is indicative of this theme.

The left video is a sequenced of fifteen clips extracted from single video which documents the rapid vaporization of a stygian substance. These clips were organized by alternating and transposing the segments in such a way that the action of the film constantly alternates between the buildup of the slow dissipation of bubbles and the expansive nucleation of boiling. Because the action is abstract, the fact that it is not sequenced chronologically means that the video is a plateau of random motion (Figure 14).

Within the video, there is no turning point or resolution, and the cycle of disjointed repetition continues without end. The denial for catharsis is also prominent in the organization of the right channel video. The speed in which the white, coral bloom increases in exponential increments of three seconds until it reaches the half-way mark (Figure 15). At this midpoint the action mirrors itself in speed and decreases exponentially in increments of three seconds. The manifestation of time within the installation is further abstracted by the inclusion of several timecodes that line the bottom of both videos.

The timestamps included in the video indicate measurements of frame amount, length of duration, and translations of feet per frames. These markers, however, do not describe or explain any amount of time that occurs within the action of the videos. They are complete misrepresentations of information. By doing this, I am engaging the viewers by playing on their willing suspension of disbelief.

Because numbers are considered by many people to always be examples of empirical information, viewers are disposed to think that are valid measurements within my work. Even if viewers do not necessarily believe in the truth of the video, they are likely to believe in the truth of a timecode. In this way, the inclusion of the timestamp is more than as a mere technical component of the work. It is content equal to that of the effervescing murk and the emerging, white flourish. The timestamp is a variable of control by which I am able to stimulate cognitive estrangement. This couples the manipulated documentation of science within my work.

The initial video used to create both channels of *Charybdis* depicts a destructive event caused by a chemical reaction resulting from the introduction of dilute acetic acid to a sodium bicarbonate crystalline structure. The bubbles featured in the video are the byproduct of the escape of carbon dioxide created because of the reaction. I grew the crystalline form over the course of several days. The compound was created by adding azane to a hypersaturated solution of sodium chloride.

I initiated fractalization by pouring the solution onto a dry mixture of active carbon and sodium bicarbonate. The form grew a cluster of self-replicating polyps which were generated via iterative and successive units of division and multiplication in such a way that the properties of each branch from the smallest scale to the largest was exponentially analogous to that of the

entire structure. In this way, the structure of the formation that I destroyed was echoed in the way that I structured the time element of the video project.

The manipulation of information presented within *Charybdis* represents both a scientific process and an artistic license. The project not only signifies my development and continued interest in depictions of scientific imagery via video, but also engages the ideologies of sense-cinema as they relate to time. By employing a scientific gaze, I am able to provide exotic new images of biological matter and chemical substances.[49]

Conclusion

By reviewing important concepts introduced in Marshall McLuhan's *Understanding Media: The Extensions of Man* (1964), Gene Youngblood's *Expanded Cinema* (1970), Gilles Deleuze's *Cinema 1: The Movement-Image* (1986) and *Cinema 2: The Time-Image* (1989), and Mark Hansen's *New Philosophy for New Media* (2006), I have surmised that not only do the mechanical processes of film and video correlate to certain cognitive processes, but also that these processes have expanded human sense perception related to the understanding of motion, space, and time. This evolution, furthermore, reveals that time is a prominent conceptual feature inextricable from the media, and that the trajectory of visual time-based images follows the understanding of this feature.

These theories are more than conceptual fodder, they are the foundation on which I have built my studio practice. By extracting and accumulating motion and time within my work, I investigate the roles of the camera and the monitor as agents of artifice and simulation. The simple chemistry experiments that I create and document provide an adequate backdrop to explore infinitesimal changes in matter reflected by motion, space, and time. From cinemagraphic animations to panoramic expanses to rupturing and emerging formations, my digital films feature the properties of accelerate, decelerate, pause, play, and loop in a way that attempts to highlight the connections between sense and cinema.

Notes

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[41] Brakhage, "Some Notes on the Selection of Titles"
[42] Camper,"By Brakhage: The Act of Seeing . . ."
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[47] MacDonald, *The Garden in the Machine,* 69
[48] McLuhan, *Understanding Media: The Extensions of Man*, 147
[49] Landecker. "Microcinematography and the History of Science and Film" 123

Illustrations

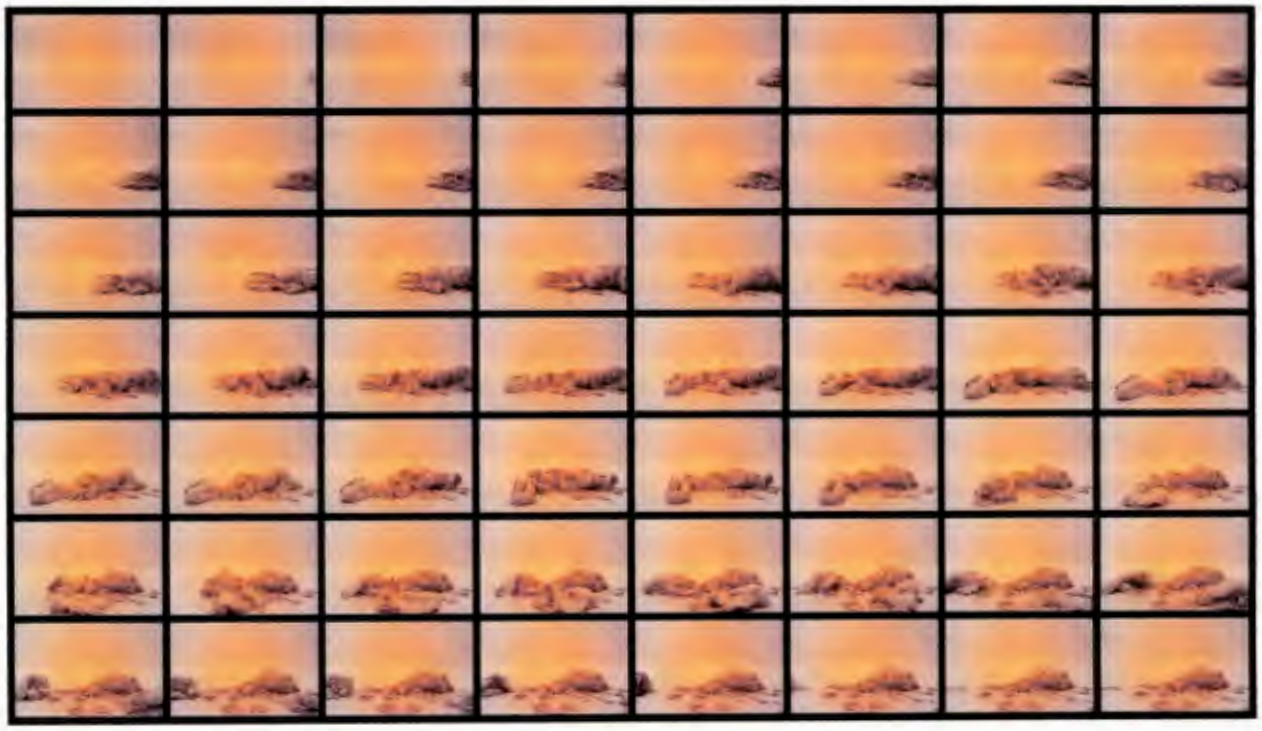

Figure 1

Rosalynn Stovall, compilation of 56 still frames from *Viscera* (2012), digital film, 7 seconds

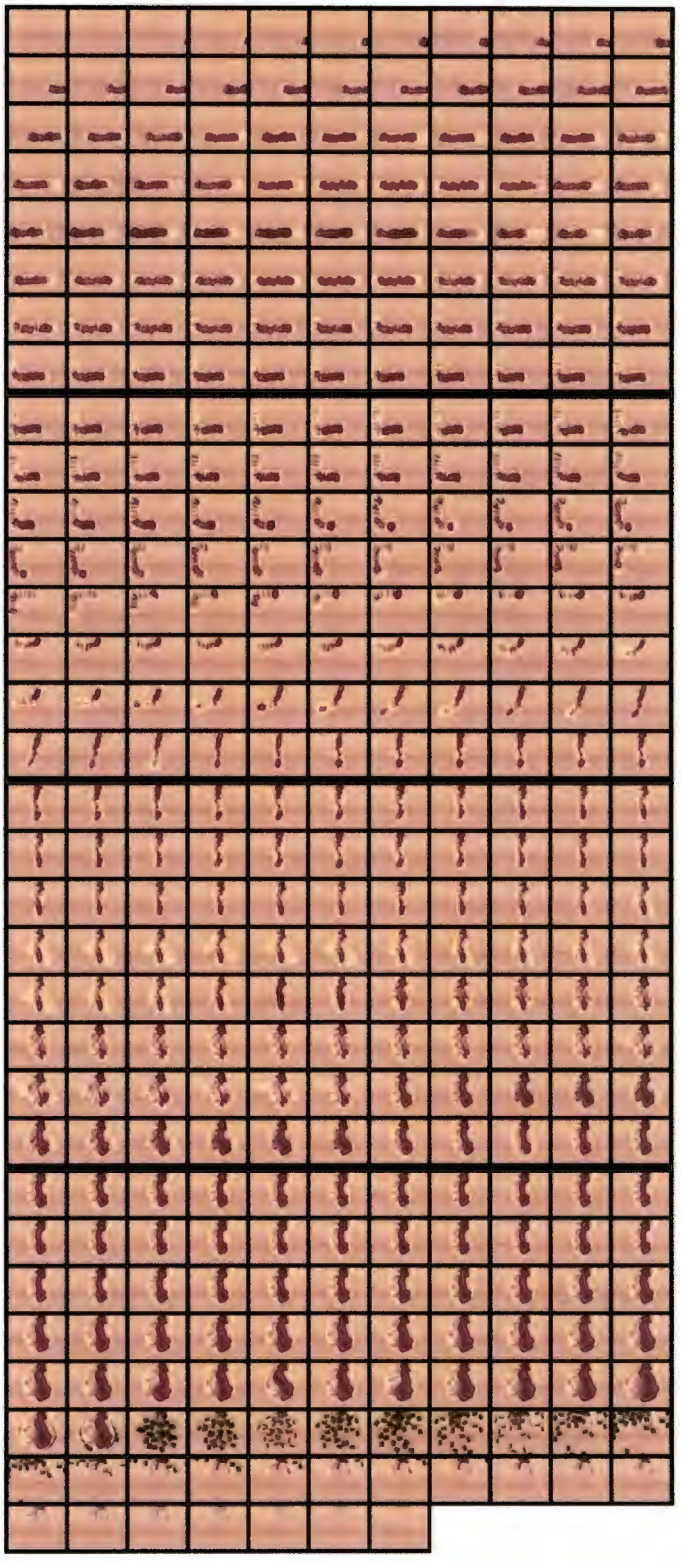

Figure 2

Rosalynn Stovall, compilation of 349 still frames from *Skulk & Scuttle* (2012), digital film, 57 seconds

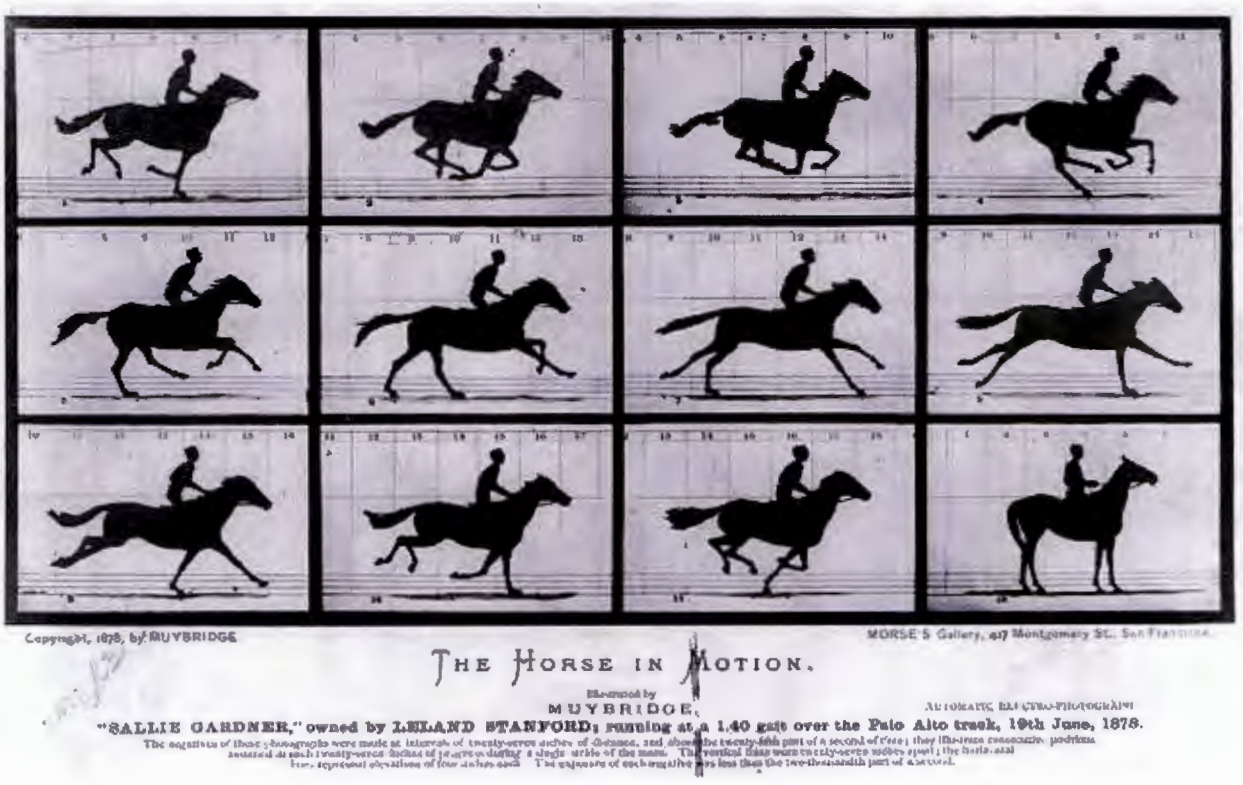

Figure 3

Eadweard Muybridge, *The Horse in motion. "Sallie Gardner," owned by Leland Stanford; running at a 1:40 gait over the Palo Alto track, 19th June 1878* (1878)

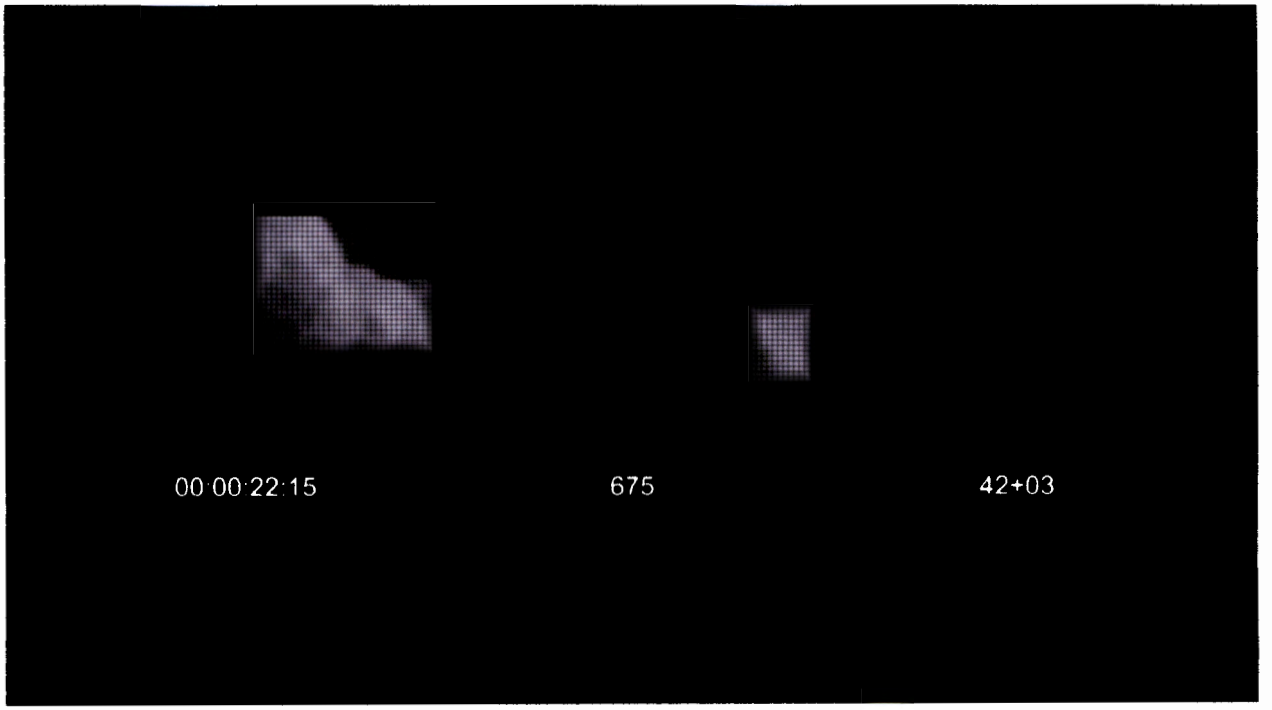

Figure 4

Rosalynn Stovall, still frame taken from *Alternative Phase Sequence* (2013), digital film, 2 minutes

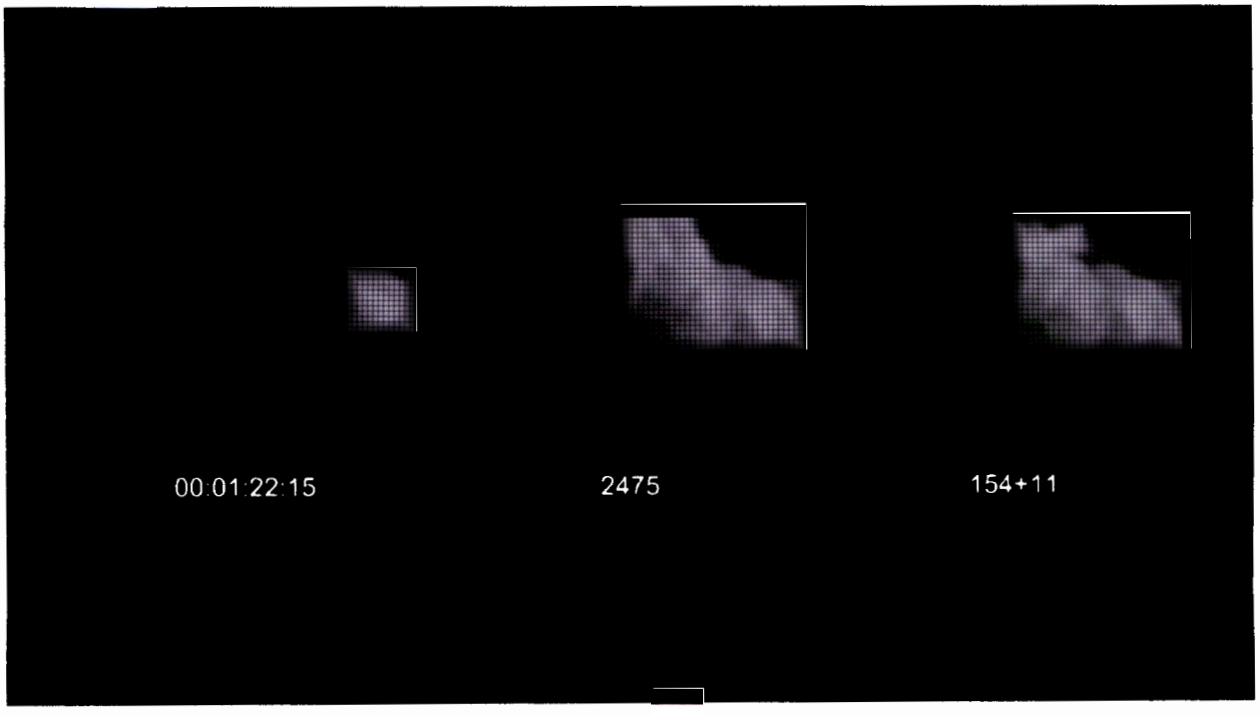

Figure 5

Rosalynn Stovall, still frame taken from *Alternative Phase Sequence* (2013), digital film, 2 minutes.

Figure 6

Rosalynn Stovall, still frame taken from the left channel video of *Open Function* (2013), digital film, 5 minutes 50 seconds

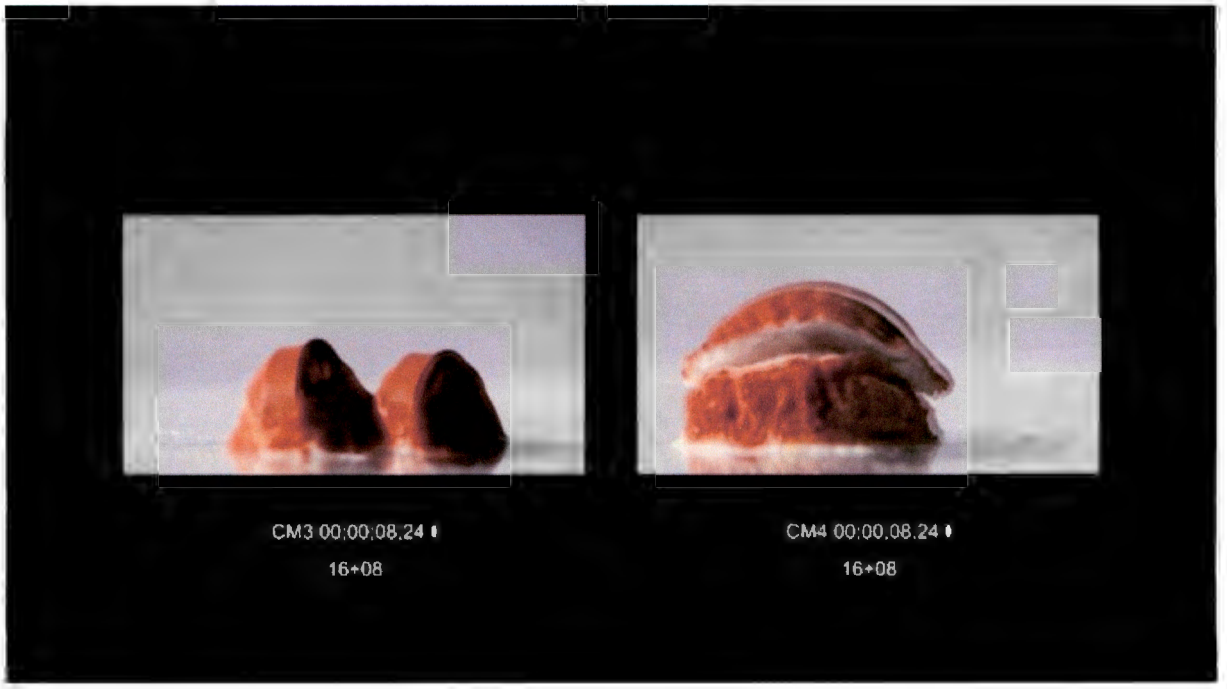

Figure 7

Rosalynn Stovall, still frame taken from the left channel video of *Open Function* (2013), digital film, 5 minutes 50 seconds

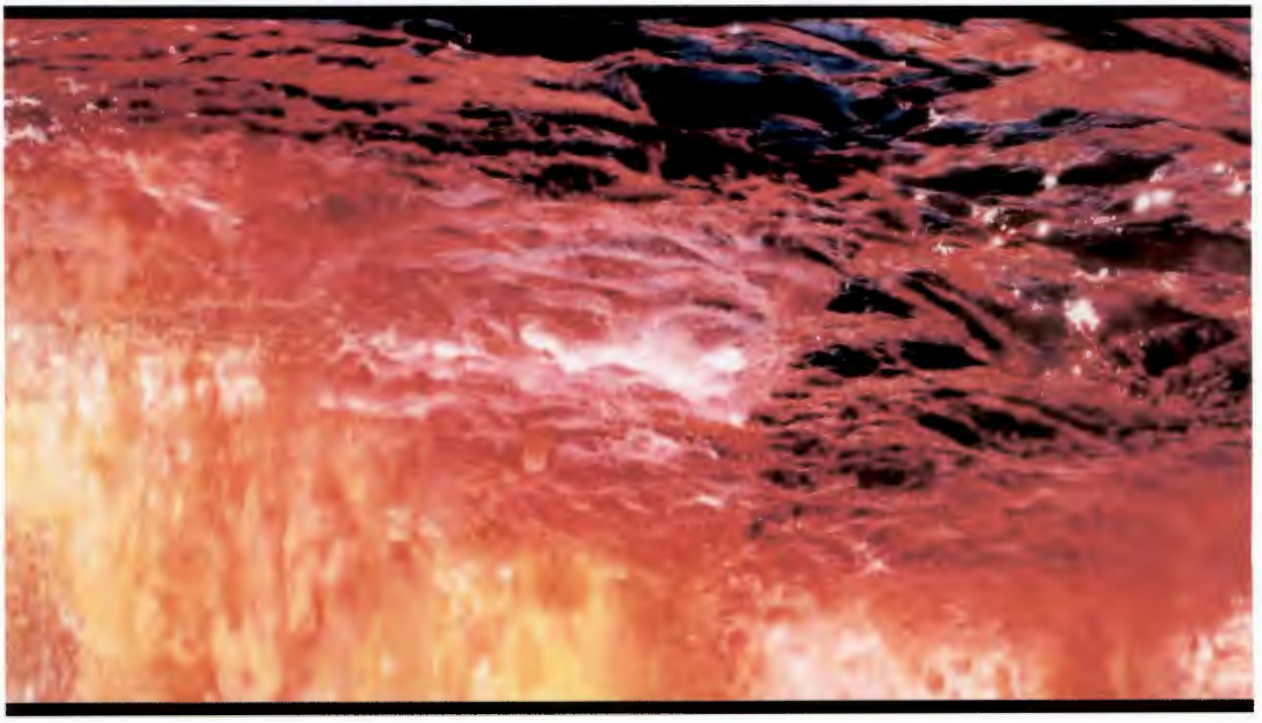

Figure 8

Rosalynn Stovall, still frame from *The PWR* (2013) digital film, 5 minutes 45 seconds

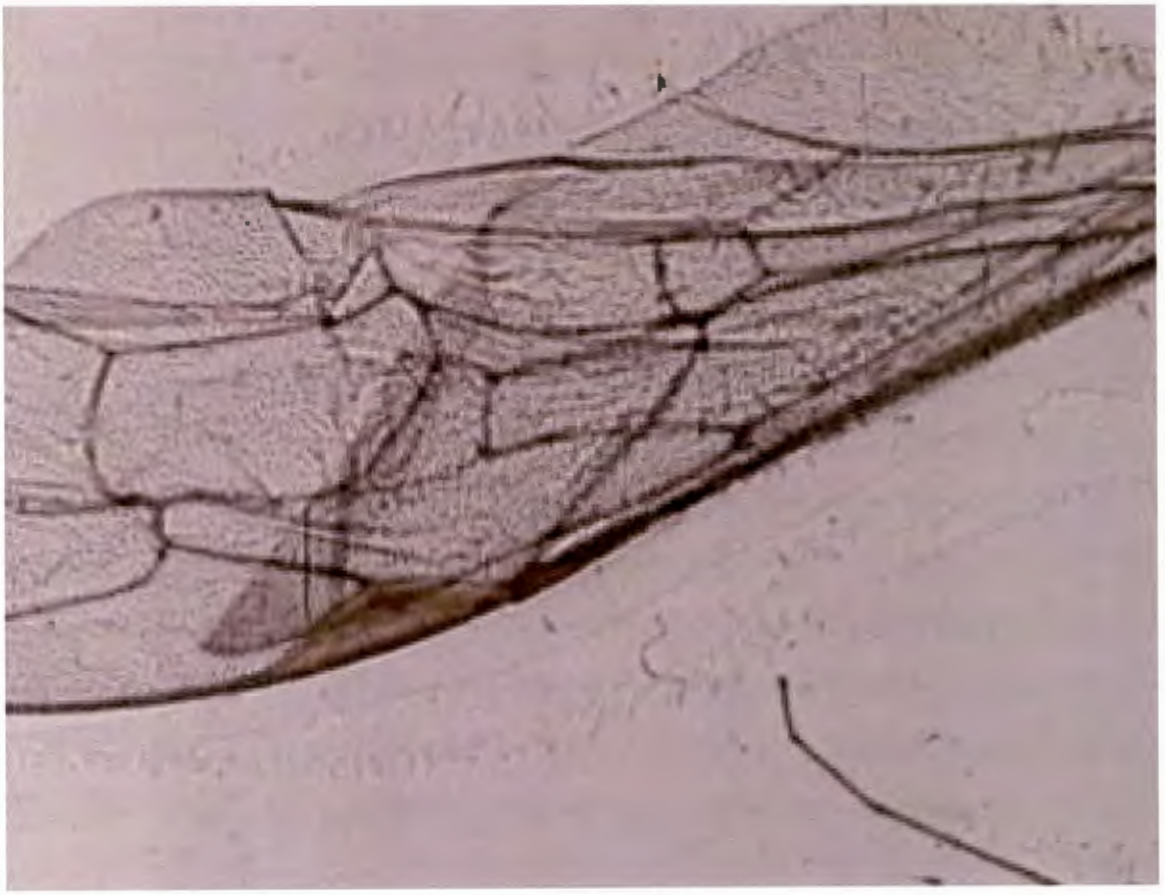

Figure 9

Stan Brakhage, still frame from *Mothlight* (1963), collage film, 4 minutes

Figure 10

Stan Brakhage, selection of film strips used to create *Mothlight* (1963), collage film, 4 minutes

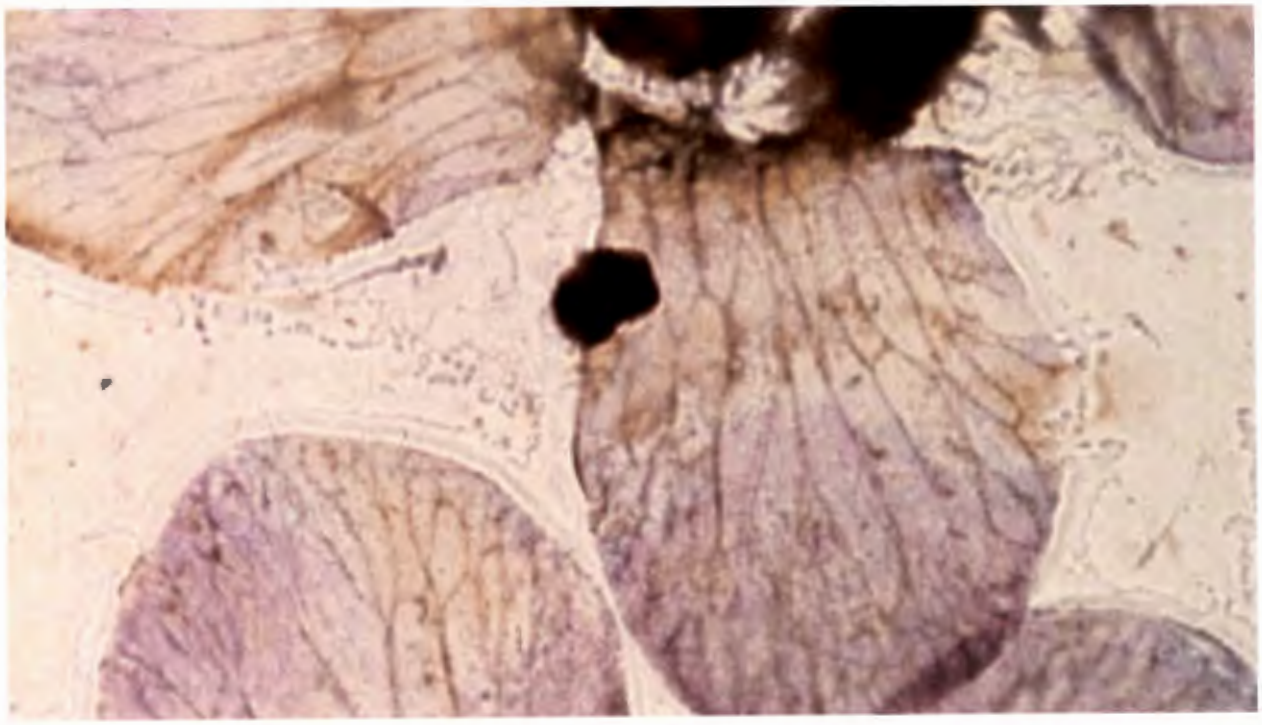

Figure 11

Stan Brakhage, still frame from *Mothlight* (1963), collage film, 4 minutes

Figure 12

Rosalynn Stovall, still frame taken from the left channel video of *Charybdis* (2014), digital film, 4 minutes

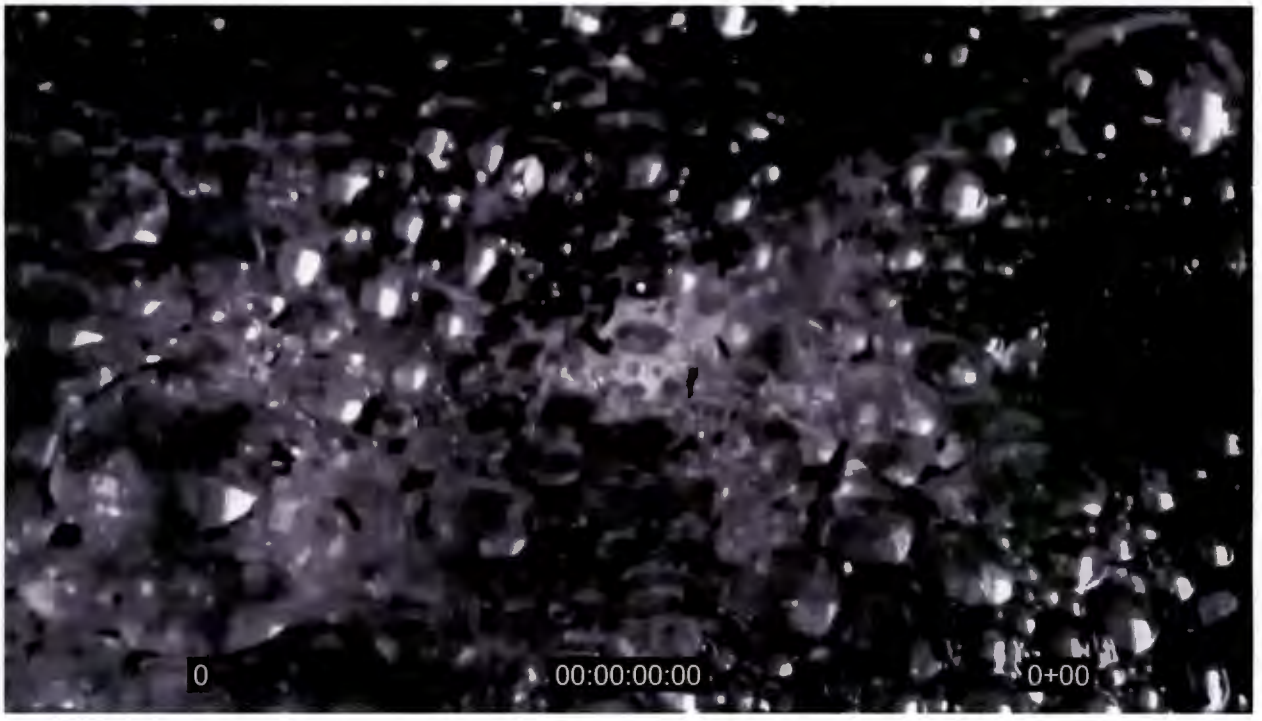

Figure 13

Rosalynn Stovall, still frame taken from the right channel video of *Charybdis* (2014), digital film, 4 minutes

Figure 14

Rosalynn Stovall, still frame taken from the left channel video of *Charybdis* (2014), digital film, 4 minutes

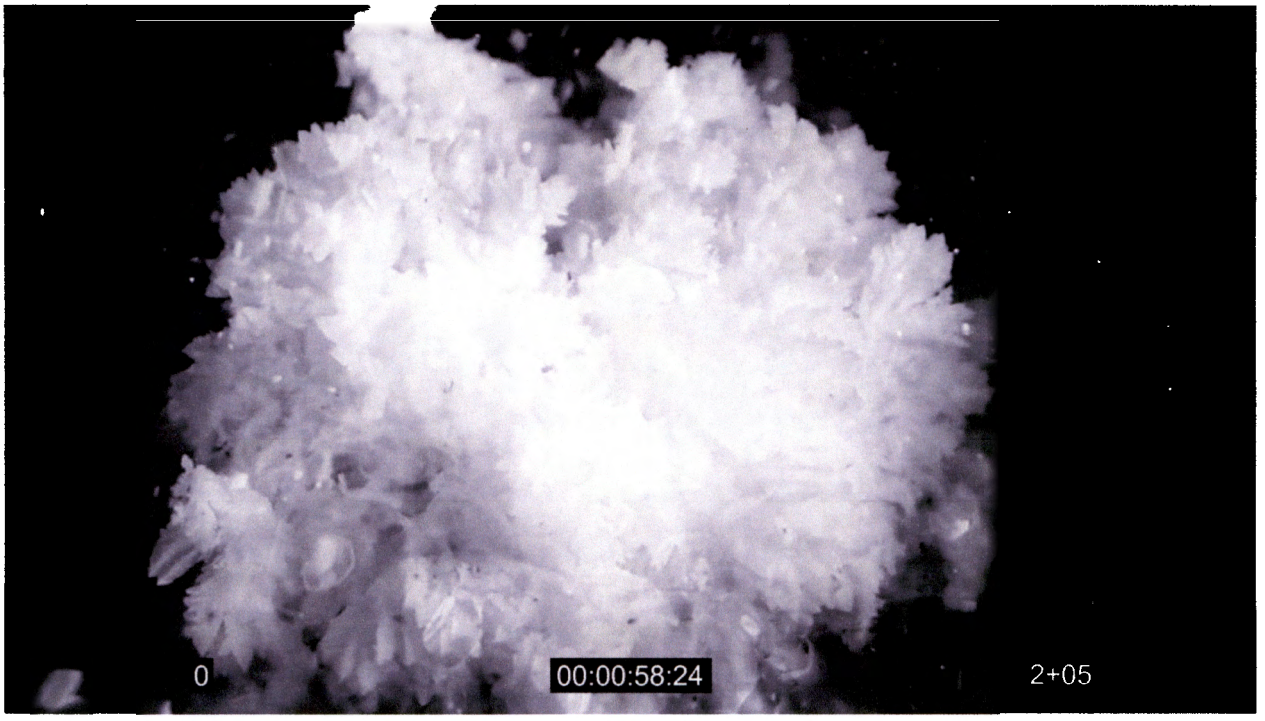

Figure 15

Rosalynn Stovall, still frame taken from the right channel video of *Charybdis* (2014), digital film, 4 minutes

Illustration Citations

Figure 1.
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Figure 3.
Eadweard Muybridge, *The Horse in motion. "Sallie Gardner," owned by Leland Stanford; running at a 1:40 gait over the Palo Alto track, 19th June 1878.* (1878) *Library of Congress*. http://www.loc.gov/pictures/item/97502309/ (accessed March 30, 2014).

Figure 4.
Rosalynn Stovall, still frame taken from *Alternative Phase Sequence* (2013), digital film, 2 minutes.

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Figure 6.
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Rosalynn Stovall, still frame taken from the left channel video of *Open Function* (2013), digital film, 5 minutes 50 seconds.

Figure 8.
Rosalynn Stovall, still frame from *The PWR* (2013) digital film, 5 minutes 45 seconds.

Figure 9.
Stan Brakhage, still frame from *Mothlight* (1963), collage film, 4 minutes. Wikimedia Commons. http://upload.wikimedia.org/wikipedia/en/1/18/ Mothlight.png.

Figure 10.
Stan Brakhage, selection of film strips used to create *Mothlight* (1963), collage film, 4 minutes. Hirshhorn Museum and Sculpture Garden. http://www.hirshhorn.si.edu/wp-content/uploads/2013/05/FGT_Stan_ Brakhage_filmstrip1.jpg.

Figure 11.
Stan Brakhage, still frame from *Mothlight* (1963), collage film, 4 minutes. The Criterion Collection. http://www.criterion.com/films/731-by-brakhage-an-anthology-volume-one.

Figure 12.
Rosalynn Stovall, still frame taken from the left channel video of *Charybdis* (2014), digital film, 4 minutes.

Figure 13.
Rosalynn Stovall, still frame taken from the right channel video of *Charybdis* (2014), digital film, 4 minutes.

Figure 14.
Rosalynn Stovall, still frame taken from the left channel video of *Charybdis* (2014), digital film, 4 minutes.

Figure 15.
Rosalynn Stovall, still frame taken from the right channel video of *Charybdis* (2014), digital film, 4 minutes.

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